JUN 2 4 2019

Mr. Jim Guilliford
Regional Administrator
U.S. EPA, Region VII
11201 Renner Boulevard
Lenexa, KS 66219

Re: 2019 Annual Ongoing Data Requirements Report for SO_2

Dear Mr. Guilliford:

The Missouri Department of Natural Resources' Air Pollution Control Program (air program) is submitting the state's stand-alone Annual Ongoing Data Requirements Report pursuant to the *Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS)*. The Annual Ongoing Data Requirements Report is due to the U.S. Environmental Protection Agency (EPA) on July 1, 2019 to meet the reporting requirements in 40 CFR 51.1205 (b).

The 2019 report addresses six modeled areas where modeling of actual SO_2 emissions served as the basis for designating the areas as attainment/unclassifiable in EPA's Federal Register notices on July 12, 2016 for Scott County and on January 9, 2018 for the remaining five modeled areas in the report. The air program recommends that no additional modeling is needed for all six attainment/unclassifiable areas based on the technical analysis in the attached ongoing report.

As required in 40 CFR 51.1205, the air program is making this final stand-alone report available for public inspection and review on our website. The air program also accepted comments on a draft of the report from May 20, 2019 to June 19, 2019. The air program received comments on the draft report from EPA, and the air program amended the report in response to these comments.
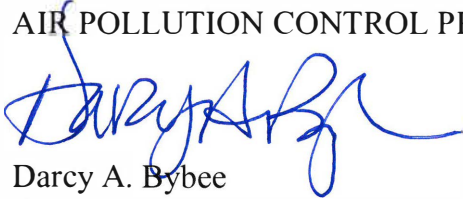
Thank you for your attention to this matter. If you have any questions regarding this Annual Ongoing Data Requirements Report, please contact Ms. Emily Wilbur, with the Department's

Mr. Jim Guilliford
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Air Pollution Control Program at P.O. Box 176, Jefferson City, MO 65102 or by phone at (573) 751-7840 or email at emily.wilbur@dnr.mo.gov.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Darcy A. Bybee
Director

DAB: brc

Enclosure: 2019 Annual Ongoing Data Requirements Report

c: File# 2019-SO2-DRR-1

2019 Annual Ongoing Data Requirements Report

Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide National Ambient Air Quality Standard

**Submittal Due Date
July 1, 2019**

**Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
P.O. Box 176
1659 East Elm Street
Jefferson City, Missouri 65102
Telephone (573) 751-4817**

Purpose and Background

The Missouri Department of Natural Resources' Air Pollution Control Program (air program) has prepared this report as the state's stand-alone Annual Ongoing Data Requirements Report for the 2010 1-hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS). This report is intended to fulfill the annual reporting requirements of 40 CFR Part 51 Subpart BB, "*Data Requirements Rule for Characterizing Air Quality for the Primary SO$_2$ NAAQS*". The Annual Ongoing Data Requirements Report is due to the U.S. Environmental Protection Agency (EPA) on July 1 each year to meet the reporting requirements in 40 CFR 51.1205 (b):

> "*(b) Modeled areas. For any area where modeling of actual SO$_2$ emissions serve as the basis for designating such area as attainment for the 2010 SO$_2$ NAAQS, the air agency shall submit an annual report to the EPA Regional Administrator by July 1 of each year, either as a stand-alone document made available for public inspection, or as an appendix to its Annual Monitoring Network Plan (also due on July 1 each year under 40 CFR 58.10), that documents the annual SO$_2$ emissions of each applicable source in each such area and provides an assessment of the cause of any emissions increase from the previous year. The first report for each such area is due by July 1 of the calendar year after the effective date of the area's initial designation.*
>
> *(1) The air agency shall include in such report a recommendation regarding whether additional modeling is needed to characterize air quality in any area to determine whether the area meets or does not meet the 2010 SO$_2$ NAAQS. The EPA Regional Administrator will consider the emissions report and air agency recommendation, and may require that the air agency conduct updated air quality modeling for the area and submit it to the EPA within 12 months.*"

In Missouri, the Counties of Greene, Henry, Jasper, Randolph, and Scott, as well as a portion of St. Louis County, are the only *modeled areas* subject to the Annual Ongoing Data Requirements Report that is due to EPA on July 1, 2019. Table 1 lists the sources that met the emission thresholds in the data requirements rule (DRR) and were designated attainment based on a modeling analysis using actual emissions data. The air program submitted the first annual report for the Scott County *modeled area* to EPA in 2017. This 2019 report is the initial annual report to EPA for *modeled areas* of the remaining counties in Table 1.

On July 12, 2016[1], EPA designated Scott County, Missouri as attainment/unclassifiable for the 2010 SO$_2$ NAAQS based on EPA's technical assessment of the air program's submittals regarding the air quality surrounding the Sikeston Power Station and the rest of Scott County. The air program's analysis was based on modeling of actual SO$_2$ emissions (initially based on

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[1] See 81 FR 45039, July 12, 2016. Two other areas in Missouri were designated as unclassifiable at the same time; however, the annual ongoing report requirements of 40 CFR 51.1205 (b) do not apply to unclassifiable areas.

2012-2014 data, updated using 2013-2015 data) from sources in and around Scott County. Further, EPA designated Jasper, Henry, Greene and Randolph Counties, as well as a portion of St. Louis County as attainment/unclassifiable for the 2010 SO_2 NAAQS in 2018[2]. Similarly, 2018 designations were based on the air program's analysis of actual SO_2 emissions for these five additional sources. Therefore, these six *modeled areas* are subject to the ongoing verification requirements under 40 CFR 51.1205 (b), and the air program is submitting this Annual Ongoing Data Requirements Report to meet the reporting requirements for *modeled areas*.

2018 Annual Emissions

Per 40 CFR 51.1205 (b), the air program is required to document the annual SO_2 emissions of each applicable source in the *modeled areas*. Table 1 lists the six SO_2 emission sources within the *modeled areas* and details respective annual actual SO_2 emissions in tons from 2012 to 2018. The air program acquired emission data from the Missouri Emissions Inventory System (MoEIS) and confirmed the emission data matched data in EPA's Clean Air Markets Division (CAMD) database.

Comparison of 2018 Emissions to Previous Year
Per 40 CFR 51.1205 (b), the air program is required to provide an assessment of the cause of any emissions increase from the previous year. Table 1 shows 2018 actual emissions increased when compared to 2017 emissions for three of six sources, specifically Montrose, Meramec, and City Utilities John Twitty. For all three of these DRR facilities, Table 2 shows this increase in 2018 annual actual emissions is attributed to increases in combined facility operating time and gross load compared to 2017.

Recommendation Regarding Updated Modeling
Per 40 CFR 51.1205 (b)(1), the air program is required to provide a recommendation in this annual report regarding whether additional modeling is needed to characterize air quality in any area to determine whether the area meets or does not meet the 2010 SO_2 NAAQS. Based on the information and assessment set forth below, the air program recommends that no updated dispersion modeling analysis is needed for any of Missouri's *modeled areas*.

In determining the appropriate recommendation regarding the need for any updated dispersion modeling analysis, the appropriate assessment should compare emission characteristics in the most recent year with the emission characteristics that were modeled for the sources of interest to inform their attainment designations. Factors for consideration in such a comparison may include total annual emissions, the level of the modeled design value from the initial modeling analysis, other relevant facility-specific information, and where appropriate, hourly emission profiles or daily maximum 1-hour emission rates.

The air program's assessment to determine the appropriate recommendation regarding the need

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[2] 83 FR 1098, January 9, 2018

for updated modeling first evaluates the annual emission totals that were modeled for the sources of interest against the actual annual emissions from the most recent year for the same sources. In the modeling performed to inform the initial designations, the modeled emissions from all six Missouri sources that are subject to the DRR ongoing reporting requirements demonstrated compliance with the 2010 SO_2 NAAQS. Therefore, if emissions in the most recent year are lower than emissions as modeled, it is reasonable to assume any updated modeling analysis utilizing the lower emission levels from the more recent year would similarly demonstrate NAAQS compliance.

Table 1 shows the 2018 annual emissions for five of the six modeled sources (all except City Utilities John Twitty) are less than the average annual emissions from either 2012-2014 or 2013-2015, as applicable.[3] Thus, any additional modeling for these five would likely result in lower maximum-modeled design values than those listed in Table 1. This supports a recommendation for no updated modeling at these five sources.

However, the air program received comments from EPA Region VII on the proposed version of this report where EPA directed the air program to provide stronger justification for a recommendation of no updated modeling for any source that displayed an annual emissions increase from 2017 to 2018. The air program notes that while 40 CFR 51.1205 (b) requires the ongoing report to document the annual emissions of each applicable source in *modeled areas* each year and to provide an assessment of the cause of any emissions increase from the previous year, the regulation is silent on the type of assessment the state should perform when making a recommendation about the need for updated modeling. The air program further notes that attempting to draw conclusions about the need for updated modeling by comparing emissions in the most recent year to the previous year in cases where the previous year was never modeled is an irrational approach. If the previous year was not modeled, then there is no ambient pollutant concentration data to use as a baseline in such an assessment. Therefore, it would be nearly impossible to draw any type of accurate conclusions about the ambient pollutant concentrations in the most recent year by comparing the emissions from the most recent year to the emissions in a year where no ambient pollutant concentration data exists. As discussed above, the appropriate assessment to inform the recommendation should compare emissions from the most recent year to the emissions levels used in the modeling analysis.

Although the air program disagrees with the need to provide extensive justification in an ongoing report for a recommendation of no updated modeling based on a year-to-year emissions comparison regardless of whether the previous year was ever modeled, the air program is providing such justification in order to address EPA's comment. The following discussions include facility-specific details considered in developing the air program's recommendations regarding the need for additional modeling for all three of the facilities showing an increase when comparing 2017 and 2018 emissions.

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[3] Table 1, Column 4 of this document

Montrose

Although annual SO$_2$ emissions increased from 2017 to 2018, the 1,548 tons of 2018 actual emissions is far below the annual emission levels in each of the individual years of 2013, 2014, and 2015, which were used in the modeling to inform the attainment designation for the area. Annual actual emissions data at the Montrose facility from 2012 to 2018 shows that 2017 (lowest emissions) and 2018 (second lowest) are both much lower compared to each of the previous five years. Therefore, an updated refined dispersion modeling analysis would likely result in even lower predicted SO$_2$ concentrations in the area surrounding this facility when compared to the maximum modeled concentration listed in Table 1.

Additionally, per the February 2019 U.S. Energy Information Administration (EIA) monthly electric generator inventory, namely EIA-860M, all three units at the Montrose facility are now retired. Specifically, Unit 1 retired in April 2016, while Units 2 and 3 retired in December 2018. Going forward, no SO$_2$ emissions are expected from this facility.

The air program recommends no additional modeling is needed to further characterize area emissions or to verify ongoing compliance with the 2010 1-hour SO$_2$ NAAQS for the area surrounding the Montrose facility.

Meramec

As mentioned previously, the increase in annual actual emissions from 2017 to 2018 is largely attributed to annual increases in both operating hours and combined gross load at the facility between these two years. However, the 3,346 tons of 2018 actual emissions is well below each of the modeled actual emissions for Units 3 and 4 combined for the respective modeled years 2013, 2014 and 2015. During 2016, a new air permit condition for both Units 1 and 2 required the use of natural gas exclusively, removing the option to burn coal in these units. Therefore, the 2013-2015 modeled emissions for the Meramec facility, which were used to inform the initial designations, utilized actual emissions from Units 3 and 4, and assumed natural gas combustion in Units 1 and 2. For this reason, Table 1 provides both facility-wide actual emissions from this facility from 2013-2015 along with the actual emissions from just Units 3 and 4 combined during those years, which corresponds to the modeled emissions used for designations.

Comparing the actual annual emissions from the facility in 2018 to the modeled emissions from 2013-2015 shows that emissions from 2018 were 2,195 tons/year less than the average annual modeled emissions from 2013-2015. Since annual emissions in 2018 were significantly lower than the emissions used in the modeling analysis that demonstrated attainment, any updated modeling is expected to result in even lower modeled SO$_2$ concentrations that would also demonstrate continued attainment at the area surrounding this source. This supports a recommendation that there is no need for additional modeling for the area.

The air program also notes the daily maximum 1-hour emission profiles for Units 3 and 4 at this facility in 2018 were generally lower or similar when compared to the modeled years (2013-

2015) (See Figures 1 and 2). This also supports a recommendation for no additional modeling for the area.

The air program recommends no additional modeling is needed to further characterize area emissions or to verify ongoing compliance with the 2010 1-hour SO_2 NAAQS for the area surrounding the Meramec facility.

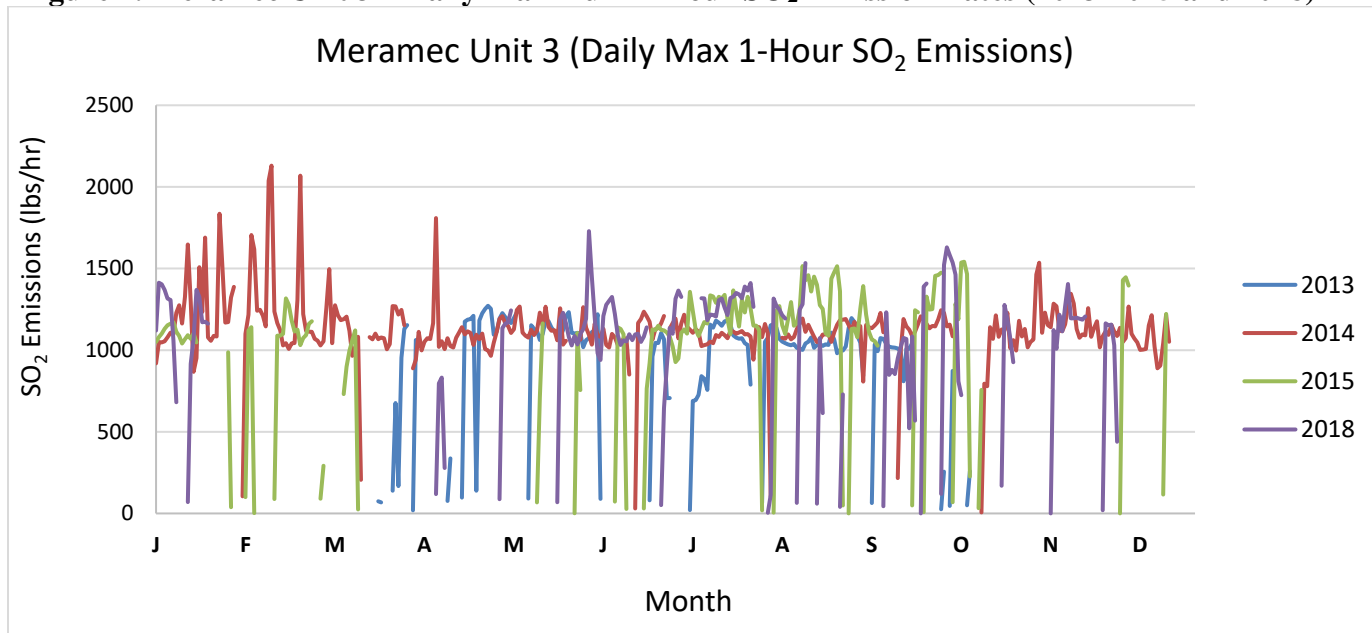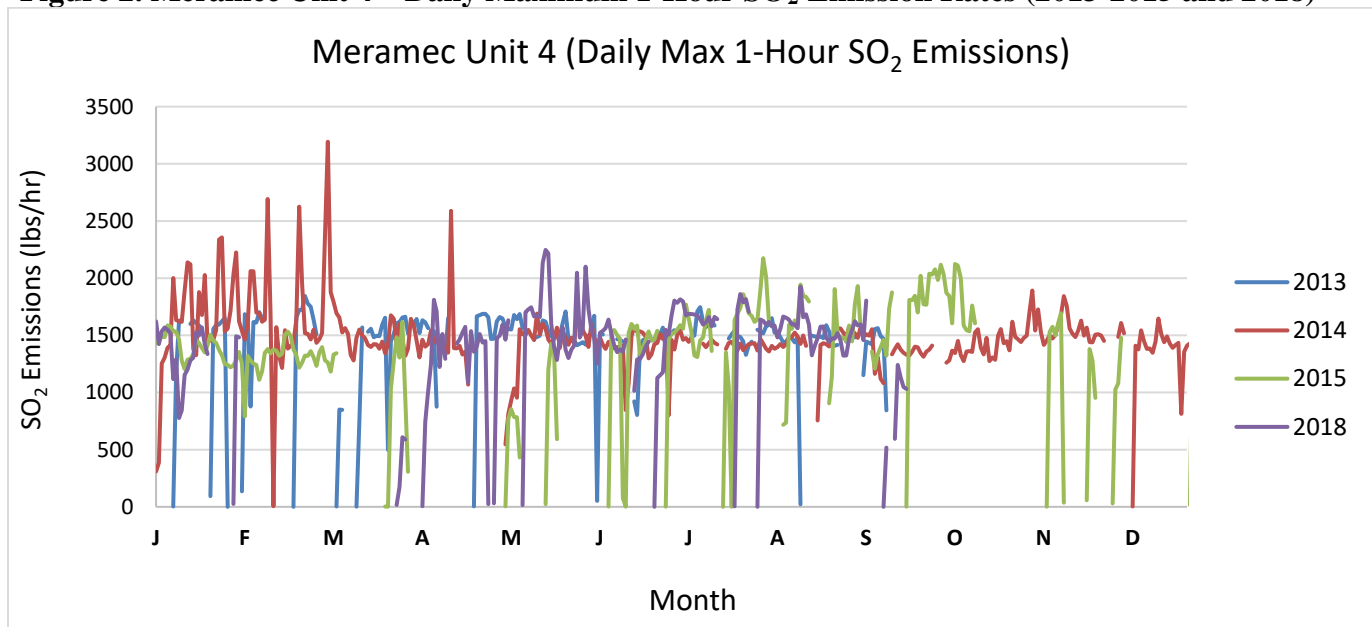**Figure 1. Meramec Unit 3 – Daily Maximum 1-Hour SO_2 Emission Rates (2013-2015 and 2018)**

Figure 2. Meramec Unit 4 – Daily Maximum 1-Hour SO_2 Emission Rates (2013-2015 and 2018)

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City Utilities John Twitty

As mentioned previously, the increase in annual actual emissions from 2017 to 2018 is largely attributed to annual increases in both operating hours and combined gross load. In addition, the emissions from 2018 for this facility were 14.1 percent higher than the average annual emissions from the facility during 2013-2015, which corresponds to the emissions that were modeled. This increase in emissions when comparing 2018 to the average emissions from 2013-2015 is also attributed to increased annual operating hours and increased gross load at the facility, as verified in CAMD.

In order to determine the appropriate recommendation for whether additional modeling is needed to determine ongoing compliance with the 2010 SO_2 NAAQS for the area surrounding this facility, the air program performed a more in depth hourly emissions profile analysis for the facility.

Compliance with the 2010 SO_2 NAAQS is based on a comparison of the 1-hour design value to the level of the standard (75 ppb). In the modeling used to inform the designations, the 1-hour design value was determined by taking a three-year average of the annual 99th percentile daily maximum 1-hour concentrations. This is the same way a design value would be calculated for a SO_2 monitor. This calculation is performed for each receptor included in the modeling domain, which gives each receptor a different 1-hour design value. The receptor with the highest 1-hour design value is considered the maximum modeled concentration and corresponds to the values listed in Table 1. Therefore, in evaluating the need for additional modeling at this facility, the air program obtained the hourly emissions data for Units 1 and 2 at the facility from 2013-2015, which was used in the modeling, along with the hourly emissions data for these units in 2018. With this data, the air program first summed the hourly emissions data for Units 1 and 2 to determine the hourly emissions from the full facility during each of these four years. Next, the air program determined the daily maximum 1-hour SO_2 emission rates for the full facility for each day in these four years. For the modeled years (2013-2015) these maximum daily values were sorted from highest to lowest and then averaged across the three years to determine the average highest, second highest, third highest, etc. daily maximum emission rates for the facility during the modeled years. The air program compared 2018 data to the average levels from the modeled years (2013-2015). Absent consideration of meteorology, which would be included in a new refined dispersion modeling analysis, this is nearly as refined of a comparison as possible for determining how emission changes at a facility might affect the 1-hour modeled design value.

Table 3 provides the top 40 daily maximum 1-hour facility-wide emission rates from 2018 along with the average of these top 40 values from 2013-2015. As shown in the table the 1st, 2nd, and 3rd highest daily maximum 1-hour emission rates in 2018 were slightly higher than the average from the modeled years. Specifically, the 1st, 2nd, and 3rd highest values from 2018 were 4.5 percent, 4.3 percent, and 1.2 percent higher than the corresponding average values from 2013-2015. However, 1-hour SO_2 design values are based on the 99th percentile of daily maximum 1-hour SO_2 concentrations, which corresponds to the fourth highest daily maximum each year. As seen in Table 3, the 4th highest value from 2018 is 10.0 percent less than the 4th highest value

from the 2013-2015 average. In addition the 5th highest through 40th highest values from 2018 are all less than their corresponding values from 2013-2015 values. This means that although annual emissions increased in 2018 when compared to the average emissions that were modeled, a new modeling analysis would likely result in a maximum modeled 1-hour design value that is lower than the value included in Table 1 for this facility. Therefore, this hourly emission rate comparison supports a recommendation for no additional modeling.

The air program recommends no additional modeling is needed to further characterize area emissions or to verify ongoing compliance with the 2010 1-hour SO_2 NAAQS for the area surrounding the City Utilities John Twitty facility.

Public Inspection and Review

As required in 40 CFR 51.1205, the air program is making this stand-alone report available for public inspection and review on our public website. The report is also available for review at the Missouri Department of Natural Resources, Air Pollution Control Program, 1659 Elm St., Jefferson City, (573) 751-4817.

In addition, the air program made a proposed version of the report available for public review and comment prior to finalizing it, specifically –

- Notice of the availability of the proposed stand-alone ongoing data requirements report was posted on the program website on May 20, 2019: http://dnr.mo.gov/env/apcp/stateplanrevisions.htm.
- The air program opened a 30-day public comment period for the proposed report after posting it on the website on May 20, 2019. The public comment period closed on June 19, 2019.
- After posting the proposed report, the air program sent an email announcement to over 1,100 recipients announcing the availability of the report and the corresponding public inspection and comment period. Email recipients included all members of the Air Program Advisory Forum, and all individuals who signed up to receive email updates for air program public notices.

The air program received comments on the proposed report from EPA Region VII. The air program reviewed and considered all comments received on the report before finalizing it, and changes were made to the report as a result of comments.

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Table 1. Annual Actual SO$_2$ Emissions and Maximum Modeled Design Values

County Name	DRR Facility (FIPS) *	Modeling information			Year of SO$_2$ actual emission from MoEIS (tons)						
		Maximum-modeled Design Value (ppb)	Years of Met and Emissions Data	Average Annual Emissions Modeled (tons)	2012	2013	2014	2015	2016	2017	2018
St. Louis	Meramec (189-0010)	52.98^	2013-2015^	5,541^	9,532	5,962 / 3,805^	11,702 / 8,701^	5,245 / 4,118^	4,342	2,896	3,346
Jasper	Asbury (097-0001)	67.5	2012-2014	6,695	6,261	7,506	6,318	1,134	1,031	909	739
Henry	Montrose (083-0001)	49.1	2013-2015	7,203	6,544	8,391	8,604	4,614	2,180	1,208	1,548
Scott	Sikeston (201-0017)	35.7	2013-2015	5,802	5,243	5,967	6,651	4,789	4,837	4,488	4,261
Greene	City Utilities John Twitty (077-0039)	42.9	2013-2015	2,759	2,799	2,584	3,021	2,672	3,316	2,629	3,147
Randolph	Thomas Hill (175-0001)	52.1	2013-2015	16,582	15,394	17,440	16,575	15,731	14,411	16,514	16,201

*Annual report required only for attainment areas per CFR 51.1205. EPA designated all Table 1 areas as attainment/unclassifiable

^The 2013-2015 modeling performed for designations for the Meramec facility utilized 2013-2015 actual emissions from Units 3 and 4 and natural gas combustion in Units 1 and 2. An enforceable permit condition required exclusive use of natural gas in Units 1 and 2, effective starting in 2016. The 2013-2015 emission columns for this facility provide facility-wide actuals (top row/informational) and Unit 3 and 4 actuals (bottom row/reflects modeled emissions).

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Table 2. Operating Hours and Gross Load for 2017 and 2018 at John Twitty, Meramec, and Montrose*

Facility Name	Unit ID	Year	Operating Time (hours)	Operating Time (facility combined – hours)	Gross Load (MW-h)	Gross Load (facility combined – MW-h)	Unit Annual SO$_2$ (tons)
John Twitty	1	2017	6,404		958,142		2,166
John Twitty	2	2017	6,034	12,438	1,189,634	2,147,776	463
John Twitty	1	2018	6,628		1,064,770		2,427
John Twitty	2	2018	8,136	14,765	1,981,745	3,046,515	719
Meramec	3	2017	2,368		412,537		934
Meramec	4	2017	4,131	6,498	819,065	1,231,602	1,962
Meramec	3	2018	3,094		601,940		1,296
Meramec	4	2018	3,810	6,904	867,962	1,469,902	2,050
Montrose	2	2017	1,966		195,441		572
Montrose	3	2017	2,089	4,055	222,174	417,615	636
Montrose	2	2018	1,983		206,676		692
Montrose	3	2018	2,354	4,337	250,530	457,206	856

*Data obtained from EPA's Clean Air Markets Division (CAMD) website

Table 3. John Twitty (Units 1 & 2 combined) Daily Maximum 1-Hour SO$_2$ Emissions

Rank	Daily Maximum 1-Hour SO$_2$ Emissions (lbs/hr)		Percent Change (2018 vs. 2013-2015 average)
	2013-2015 Average	2018	
1st highest	2,559	2,675	4.54%
2nd highest	2,473	2,579	4.26%
3rd highest	1,980	2,003	1.17%
4th highest	1,917	1,725	-10.01%
5th highest	1,887	1,710	-9.39%
6th highest	1,826	1,705	-6.65%
7th highest	1,805	1,572	-12.92%
8th highest	1,786	1,570	-12.09%
9th highest	1,752	1,569	-10.44%
10th highest	1,745	1,557	-10.77%
11th highest	1,735	1,545	-10.96%
12th highest	1,732	1,544	-10.81%
13th highest	1,707	1,542	-9.66%
14th highest	1,699	1,534	-9.72%
15th highest	1,684	1,531	-9.06%
16th highest	1,678	1,530	-8.85%
17th highest	1,660	1,522	-8.31%
18th highest	1,655	1,509	-8.85%
19th highest	1,648	1,507	-8.56%
20th highest	1,640	1,502	-8.40%
21st highest	1,635	1,495	-8.57%
22nd highest	1,632	1,486	-8.94%
23rd highest	1,627	1,486	-8.68%
24th highest	1,621	1,485	-8.41%
25th highest	1,605	1,477	-8.01%
26th highest	1,602	1,467	-8.40%
27th highest	1,598	1,466	-8.24%
28th highest	1,590	1,465	-7.84%
29th highest	1,571	1,429	-9.05%
30th highest	1,564	1,427	-8.78%
31st highest	1,556	1,426	-8.35%
32nd highest	1,547	1,424	-7.93%
33rd highest	1,544	1,408	-8.80%
34th highest	1,539	1,403	-8.84%
35th highest	1,535	1,390	-9.43%
36th highest	1,522	1,382	-9.16%
37th highest	1,515	1,361	-10.17%
38th highest	1,507	1,342	-10.94%
39th highest	1,504	1,338	-11.02%
40th highest	1,498	1,326	-11.45%